

US EPA Mid-Continent Ecology Division

Research Project Summary

Risks to Fish Populations from Polyaromatic Hydrocarbons in Natural Systems

Overview

A major uncertainty in assessing the risks of persistent bioaccumulative toxicants (PBTs) to aquatic life is whether application of laboratory toxicological data to risk assessments adequately addresses complex exposure and effects relationships important to responses in natural systems. Polycyclic aromatic hydrocarbons (PAHs) are an important group of PBTs whose assessment is complicated by difficulties in predicting accumulation and metabolism, in assessing the aggregate effects of PAH mixtures, and in determining the degree to which their effects are aggravated by simultaneous exposure to ultraviolet (UV) light.

Current research is centered on documenting and understanding PAH effects in a field setting. Specific research objectives include:

- (1) Relative to the PAH contamination in water and sediments, what PAH levels are expected in early life stage (ELS) fish?
- (2) What levels and wavelengths of UV-light are ELS fish subject to in natural systems?
- (3) How are effects in ELS fish quantitatively related to PAH accumulation and UV-exposure?
- (4) How can the expected cumulative effects to ELS fish of PAH mixtures in natural systems be quantified?

Combined with other information, this research will form the basis for a comprehensive approach for assessing the expected ecological effects and associated risk of PAH exposures in aquatic systems.

Key Products

Diamond SA, Mount DR, Burkhard LP, Ankley GT, Makynen EA, and Leonard EN. 2000. The effect of irradiance spectra on the photo-induced toxicity of three polycyclic aromatic hydrocarbons. *Environ Toxicol Chem* 19:1389-1396.

Diamond SA, Milroy NJ, Mattson VR, Heinis LJ, and Mount DR. 2003. Photoactivated toxicity in amphipods collected from PAH contaminated sites. *Environ Toxicol Chem.* (In press)

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